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The Forester

A DELIGHT IN THE PARK—AN EYESORE IN THE FOREST.

A monthly magazine, devoted to the care and use of forests and forest trees, and related subjects.

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THE AMERICAN FORESTRY ASSOCIATION.

ORGANIZED APRIL, 1882.

INCORPORATED JANUARY, 1897.

The object of this Association is to promote:

1. A more rational and conservative treatment of the forest resources of this continent.
2. The advancement of educational, legislative and other measures tending to promote this object.
3. The diffusion of knowledge regarding the conservation, management and renewal of forests, the methods of reforestation of waste lands, the proper utilization of forest products, the planting of trees for ornament, and cognate subjects of arboriculture.

Owners of timber and woodlands are particularly invited to join the Association, as well as are all persons who are in sympathy with the objects herein set forth.

OFFICERS OF THE ASSOCIATION:

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Sir H. G. JOLY DE LOTBINIÈRE, Quebec, Canada, First Vice President.
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Corresponding Secretary,
WASHINGTON D. C.

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Meetings of the American Forestry Association.

Three summer meetings are projected in such a manner that all three may be attended in succession:

In the ***YOSEMITE VALLEY,*** in the latter part of July, under the auspices of the Commissioners in charge of the Valley and the Sierra Club;

At ***OMAHA, NEB.***, in the first part of August, at the invitation of the officials in charge of the Trans-Mississippi and International Exposition;

At ***BOSTON, MASS.,*** in the latter part of August, in connection with the semi-centennial meeting of the American Association for the Advancement of Science.

A local committee at each place is in charge with the following chairmen: Abbot Kinney, Limanda, Cal.; Prof. F. W. Taylor, Lincoln, Neb.; Gen. Francis H. Appleton, Boston, Mass.

It is desirable to know beforehand how many members may attend any one or all meetings, in order to make proper arrangements for reduction in transportation, hotel rates, excursions, etc.

ALL members who are likely to attend will please notify the undersigned of the fact.

F. H NEWELL, Secretary.

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PUBLISHER'S ANNOUNCEMENT.

THE FORESTER is published monthly by the American Forestry Association at

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THE FORESTER will be furnished free of charge to all active and honorary members of the Association. Members of State Forestry Associations affiliated under Article III of the Constitution will receive the journal at club rates.

CONTENTS.

The Forester desires to complete files of its first three volumes and will pay full price for such back numbers as it lacks.

Treeplanting, Forestry and Arbor Days.

The time of tree-planting and "Arbor Days" is at hand, and hence we devote a large share of this issue to considerations of other branches of arboriculture than forestry.

Many of our friends seem still ignorant of the fact that arboriculture and forestry are by no means synonymous. This confusion of names, and hence of ideas, we believe has done much to retard the practical application of forestry in the United States.

Through this misconception the public has been led generally to class under the name of forestry everything pertaining to trees, and as forester anybody who has knowledge of trees or has charge of planting or caring for trees for whatever purpose. Hence we hear of the employment of "city foresters," meaning thereby men who look after the trees planted along the streets or in parks.

Forestry, to be sure, has also to deal with trees, but for purposes entirely different and with methods entirely different from the purposes and methods employed in other branches of arboriculture.

Forestry, to be sure, is a special branch of the broader subject of arboriculture, which embraces also orchard growing, park and roadside planting, and all pursuits in which the growing of trees—tree-culture—forms an object or part.

To come to a clear conception of the different branches of arboriculture we

must keep in view the special object for which trees are cultivated.

In orchards the fruit is the main object; in parks, lawns, on roadsides, the shade, the aspect, the æsthetic element in trees is the consideration; in forestry the substance of the tree, the wood, is the main object, the growing of wood-crops.

Forestry has to do with forests, as the word implies, with trees in masses, grown for their wood and sometimes for the incidental influence they are supposed to exercise on climatic, soil and water conditions.

Both foresters and landscape-gardeners employ tree growth to obtain their results, but the final result of forestry is in the removal, that of landscape gardening in the presence, of the tree.

To be sure, there can be mixed objects and side issues may be subserved by either form of arboriculture. A park furnishes wood, but it is not its principal object; the Chestnuts and Hickories of the forest furnish fruit, but if it were their main object, it would be preferable to grow them in orchard fashion, when they would produce more and better fruit. The methods as well as the considerations of orcharding, park management and forestry differ absolutely as every professional forester can explain.

Forests, the great resource of our enormous wood consumption which supplies our lumber market with a billion dollars' worth of products annually, grow in the humid regions and always will grow there, we believe. Whatever planting of groves is done in our prairies and plains, in our sub-arid and arid regions may serve the very useful purpose of climatic amelioration—a protection to the settler's homes and fields and to interrupt the monotony of the landscape, and perhaps to furnish a local supply of inferior wood materials, but it cannot, we believe, have any result affecting the great economic question of furnishing this nation with its needful wood supply.

Whether "Arbor Days" will contribute much to the practical solution of the question, as the author of this lovely national festival seems to anticipate in the communication which we print on another page, appears to us very doubtful.

We are ourselves believers in the doctrine that emotion rules the world almost to a greater extent than reason, and hence to create highly enlightened civilizing tendencies the emotional and the esthetic side, especially, of our children needs education; the setting aside of "arbor days" for school children we think, therefore, an admirable institution.

Even men and women, and especially woodland owners, can only benefit from participation in rationally conducted arbor day exercises in that their thoughts are led into a direction which may otherwise have remained foreign to them, and these thoughts may eventually lead to their practical expression, provided their practical turn of mind has also been stimulated by the exercises.

Forests will be managed properly and reproduced *when it pays* to do so, and love of trees or zeal for the beautiful will have as little to do in this business of wood-cropping, as love for the waving wheat field and the beauty of the tasseled corn is the incentive to the farmer to plow and sow.

Forestry finally consists not in planting trees but in cutting trees judiciously. *The axe is the tool of the forester.* The planting tool he is called upon to use

when the woods have been mismanaged, when waste places are to be recuperated by tree growth, when treeless regions are to be afforested. And then he plants differently from the planter of street trees, parks and lawns or orchards. Where they plant hundreds, he plants thousands; where they start with thrifty saplings, he begins with tiny seedlings; where they watch and prune and cultivate trees, he lets his acres of young forest take care of themselves after he has once properly started them.

The picture on our cover—with the most beautiful of conifers, the Nordmann Fir, from the Caucasus in the center—is intended to convey an idea of a perfect group of trees in a park, which to the forester would be an eyesore in the forest, where he proposes to grow not trees but logs, long shafts without branches.

THE FORESTER welcomes all means of arousing the nation to the appreciation of forestry, be it from the emotional or the practical side, but it expects that this appreciation will be asserted on business grounds before the present generation of school children will have come to it on emotional grounds.

News and Editorial Comment.

We note with interest a revival in forestry matters in the State of Ohio, the birthplace of the American Forestry Association, which convened for the first time in Cincinnati (1882). It comes in the shape of two bills introduced in the Assembly, the one to establish a forestry school of forestry experiment at the Ohio University at Athens, the other to transfer the duties of the forestry bureau, which was established in 1885, to the Ohio State University.

That is to say, two different educational institutions vie in the attempt to revive the forestry movement.

It seems to us that there can hardly be a difference of opinion that the position taken by Prof. Lazenby before the Senate Committee is correct, namely, that if the State is to do anything in this direction it should do so through the State institution.

Both propositions, if placed in one institution, are in the main correct in principle.

The State Forestry Bureau, which at first was quite active and under the assiduous secretaryship of Adolph Leue, published five annual reports of considerable educational value, seems in later years to have fallen into innocuous desuetude. At least, if it was not buried, we have never been able to elicit a spark of life from it, in spite of several attempts.

The present bill transfers its duties to a "department of forestry" in the Ohio State University with one director. His functions are to be not only educational, as the State Bureau's were, but he is to be placed in charge of one main and four substations of 20 acres or less and of any other University lands that may be utilized for tree culture. It is left uncertain exactly what he is to do with these stations, except that he is to plant trees; but wherefore?

Another important provision of this bill is the "easement of twice the number of acres planted in forest trees from taxation for all purposes, to continue as long as there shall remain standing upon said lands at least one hundred growing

trees per acre"; and also an easement of the taxes on all lands "having thereon not less than fifty growing forest trees per acre, each of said trees to measure not less than six inches in diameter at a height of four feet from the surface of the ground, with no portions of said lands absolutely cleared." The township assessor is to report the acreage under exemption to the director.

We cannot help smiling at this attempt of devising a standard for the exemption, based on a somewhat misty conception of what a forest plantation might be. At some other time we will take occasion to discuss more at length the general idea of exemption from taxation as a means of encouraging forestry—an idea which in spite of the unfavorable experiences of the past has been again revived in several quarters.

The New Jersey Forestry Association was favored at a recent meeting at Trenton with an address by President S. Bayard Dod, of Hoboken, in which the forestry needs of the State were very clearly presented. He urged the appointment of a State Forestry Commission, with a special view to the suppression of forest fires, and reviewed recent forestry legislation in the adjoining States of Pennsylvania and New York.

The Association appointed a legislative committee, composed of President Dod, Mr. John Gifford, Mr. M. Taylor Payne and Senator E. C. Stokes.

Resolutions were passed recommending that more attention be given practical forestry in the State Normal School and in teachers' institutes, and urging the State press to give the subject of forestry the public consideration and attention its importance demands.

Mr. Gifford Pinchot, of New York, was present and also addressed the Association, devoting his attention especially to the subject of forest fires, a subject which provoked general discussion by the members present, during which Mr. John C. Gifford, who has studied the question in New Jersey more carefully than any one else, declared that "the best way to fight fires was not to have any fires to fight." Better police regulations were needed more than fire fighters. Vigorous steps taken to enforce present laws would prevent most of the forest fires that occur.

We believe that this can only be done by having a responsible officer at the head of an organized police force.

We call special attention to Mr. Gifford's interesting article on *Forestry in Virginia*, printed in this issue, which describes a natural forestry system in this country, practiced almost unconsciously by a farming community.

We are informed that the New York-New Jersey Palisades Commission has resigned and that the House Committee of Congress has decided to report unfavorably the bill to create a national park which would take in the Palisades. While indirectly THE FORESTER and the American Forestry Association is interested in any movement which looks to a proper appreciation and preservation of natural conditions favorable to economic life as well as to esthetic enjoyment, it appears nevertheless questionable whether the Federal Government should take such an active interest in the preservation of the Palisades as was expected of it, especially when this involves the purchase of lands, while the Government is hardly able to take care of the lands which it owns and has reserved.

This is indeed a matter for the two

States in which the property lies, to look after, and perhaps the city of New York has, or ought to have, most concern in it.

We would regret, therefore, if the Commission gave up its labors, which should be directed towards creating the necessary public opinion.

After all, the destruction of the Palisades, we are inclined to think, is not so imminent as we are made to believe; at present the progress of the quarries is infinitesimal. Nevertheless, vigilance and timely interference is necessary to prevent even the possibility of losing this grand natural entourage of the Hudson River; hence, the Commission should hold on and gradually bring about the necessary State action to secure the park.

As far as we have been able to learn the suspension of Mr. Cleveland's order, making a number of forest reservations until March 1, has expired by limitation without even an attempt to change the boundaries. Supposedly those opposing the reservations have come to trust that at the proper time, *i. e.*, when the knowledge as to proper boundaries is ascertained by the Geological Survey, the Executive will make the reasonable changes.

Meanwhile in Sen. Doc. No. 47 a preliminary statement of the survey work by the Geological Survey has been published, referring mostly to executive details, and we understand a report on results is now going through the press and may be available next month.

The interest in other branches of arboriculture than forestry is growing apace and exhibits itself in the formation of local Associations for the purpose of looking after city trees. The latest of which we are informed is a "Tree-planting and Protective Association" formed on Staten Island.

The "New York Tree-planting Association" has set out many trees on Murray Hill and neighborhood and is making a canvass to secure orders for trees to be planted this spring on Madison and Fifth Avenues, as an object lesson to the residents of the city. The "Tree-planting and Fountain Society of Brooklyn" not only publishes a voluminous report, rather poorly edited, full of information, but actively engages in planting and caring for street trees.

It is a novel experiment that A. C. Merryman, the Marinette (Wis) lumberman, is trying, as a result of which he hopes to establish the fact that the Spruce of Maine can be successfully grown upon the large tracts of denuded lands in the northern sections of Wisconsin and Michigan. To be sure, since this same spruce is a native of Michigan, the experiment, if properly made, cannot help being successful.

As we go to press Governor Black has signed the bill establishing the Forest Experiment in the Adirondacks and creating a State College of Forestry under Cornell University.

A movement has been started in Berkshire County, Mass., for the preservation of Greylock, the highest and most beautiful mountain in the State. It is proposed to make a State park of the peak and thus preserve its scenic beauties from the encroachments of wood-choppers. This mountain covers an area of about seventy square miles, and is the source of eighteen picturesque brooks. At present the Greylock Park Association of North Adams controls a few acres on the summit. Among those interested in the new movement are President Carter, of Williams College, Dr. John Bascom and Professor Dale.

The Effects of Arbor Day upon Economic Forest Planting.

The managing editor of THE FORESTER, under date of March 14, 1898, asks the undersigned to contribute his impressions upon the above subject.

Whenever any cause, either in the field of economics or æsthetics, is taken up by the teachers and made part of the education of the pupils of the common schools of the United States, it is assuredly on the safest and best road to ultimate triumph. Arboriculture and forestry are made prominently attractive and irresistibly alluring by successive celebrations of Arbor Day in all the schools of nearly all the counties of nearly all the States of the American Union. This anniversary has already evolved a vast amount of literature as to the beauty and value of trees and forests. Entertaining and instructive pamphlets and books upon this subject are found in nearly every village, in thousands of school-houses, in vast numbers of public libraries and in many American homes. These writings are developing both the æsthetic and economic value of tree-planting, and more arboriculture in the United States can be traced to Arbor Day and its proper celebration than to any and all other causes.

In a republic forestry cannot be forced upon the people as it may be by the edicts of monarchy in some European States. A system of forest-forcing by governmental agencies cannot be made successful in the United States. But tree-planting and forestry may be made so popular in American schools, and woodlands proved to be so important to the welfare of our race in this and succeeding generations, that the best class of citizenship will, in the near future, enthusiastically advocate and practically advance and exalt them. Thus fervid zeal in behalf of the woodlands and the forests will at last become, by communal heredity, an American trait. Only under the inspiration of a love of nature and trees, which may be intensified by the educational system of the country, may we hope for useful and pratcical forest conservation. That educational system may also develop a patriotic American scheme for planting out new forests. Sooner or later text-books on arboriculture and forestry will be used in the common schools. Half the sum of money which has already been expended by the Division of Forestry of the U. S. Department of Agriculture in timber testing and in impractical experimentation, would secure elementary school-books enough on Arboriculture and Forestry to supply the United States for several years.

J. STERLING MORTON.

ARBOR LODGE.

[We had hesitated to print the last sentence of Mr. Morton's communication, since it seemed to imply an uncalled-for, unfriendly criticism on the administration of the late Secretary of Agriculture who, speaking officially in his report to the President regarding this very timber-test work, which was then under his direct control, used the following language:

"Members of the American Forestry Association, and all other citizens interested in the conservation of woodlands and the reafforestation of denuded areas of lands not suitable to tillage, will be pleased to read in 'Danckelman's Zeitschrift, September, 1893,' the deserved compliment which the reviewer of the United States timber examination work (instituted by B. E. Fernow, in charge of forestry interests) has unreservedly awarded this Department. The judgment of Mr. Fernow's work in this division, in his scientific investigation of the several varieties of timber, as to strength, durability and general utility, in relation to the conditions of growth, is all the more valuable because the gentleman who gives it is himself in charge of forestry work of a similar character for the Prussian Government. And it is, therefore, a matter of congratulation among all those who realize the importance of forestry work in the United States, to read the following unequivocal and merited commendation of the work of this division in the Department of Agriculture:

'This plan of work is as remarkable for

its scope as for consistent pursuit of an eminently practical result. Although Germany has accomplished a great deal in some directions of this field, especially in investigating the laws of growth and wood structure, we are yet far from having such a comprehensive and indispensable knowledge even of our most important timbers. We must admit with a certain sense of humiliation, that the Americans show us what it is we really ought to know, and that they have already by far surpassed us in the elaborate organization for these investigations.

"If, in less than a decade, Americans have in a forestry specialty surpassed Germany, why can not we a generation hence rejoice in the most efficient system of the world?"

We also must express doubt as to the propriety of the Government going into the business of publishing "elementary school-books." This would seem paternalism with a vengeance, to which Mr. Morton was formerly known to object. We think this had better be left to publishers, who would do it if there were a call for such books. EDITOR.]

Park Management and Forestry.

We welcome with great satisfaction the first report of the (National) Park and Outdoor Art Association, which came into existence in Louisville, Ky., on May 20, 1897, although it is still without a formal constitution and by-laws, which are to be drafted by a special committee and presented for adoption at the next meeting at Minneapolis on June 22, 1898.

In the absence of such constitution the exact character of the Association, whether it is to be professional only or made up of both professional and amateur promoters of the art, cannot be foretold. It is interesting to note the divergence of opinion in this respect, which is found in the printed correspondence on the subject, some seeing no need for the Association, others wishing to keep it of a high professional character, others again advising a composite. Among the latter Mr. Charles Eliot, in evident accord with the views of one of his partners, Mr J. C. Olmsted, of the well-known Boston firm of landscape-architects, writes as follows:

"It seems to me that it would be best to begin by organizing, not a professional but a general association, to be made up of all who desire the advancement of landscape art, much as the Forestry Association is made up of those who hope for the advancement of real forestry in our country."

This seems to us sound. Landscape-gardening, as a profession, existed in this country before the word forestry was even defined in our dictionaries, and yet even to-day there are not enough professional landscape-architects to make much of a society. Similarly, when the Forestry Association was formed the men in this country who had professional knowledge of the subject could probably be counted on the fingers of one hand. The Association was formed to make the need of professional foresters apparent, just as the Park Association still needs to bring the desirability of systematic development of the art before the public. Presently there will be more professional foresters in the Forestry Association, as their number is increasing and their services are demanded as a result of the propaganda; just so landscape architecture and park management must grow in appreciation by the effort of all those who are interested, professionally and unprofessionally.

The Forestry Association would welcome such a general park association, for it would remove from its seeming responsibilities that of looking after the interests of a branch of arboriculture which is in no way germane to forestry proper.

Arboriculture — tree-planting of all kinds—has been supposed to be synonymous with forestry, somewhat to the detriment of the objects of the Forestry Association.

The object of a Forestry Association is an economic one, that of a Park and Open Art Association an æsthetic one; the only relations in common are that both have to deal with treegrowth and both are in existence for a higher civilization.

It is the expressed intention of THE FORESTER to devote a part of its space to considerations of park and grounds management, since many of its readers have taken an interest in forestry from that direction, and THE FORESTER should welcome the Park Association as a contributor to arboricultural subjects.

The report of the Association, unindexed we regret to say, brings a number of valuable papers, which show that municipal or public park management was principally represented among the contributors.

The following list of papers will show the general scope of the subject:

Purposes, Use and Management of Large Parks; Parks and Municipal Art; Rural Parks in Prairie States; Parks as Investments and Educators; Park Design and Park Planting; Ornamental Planting for Public Parks and Grounds; Metropolitan Park System of Boston; Park Development of New Orleans.

An interesting table was presented by the presiding officer, showing the park area of 33 cities, a round 50,000 acres, representing a population of thirteen and one-half millions, to have cost over one hundred and eighty million dollars, certainly a sufficiently well-developed interest. Boston, New York and Philadelphia are in the lead, with Newark, N. J., a close fourth, exceeding in acreage the parks of Chicago and St. Louis. W.

The Essentials of Park Planting.

Essentials of park planting are:

A knowledge of the character and condition of the soil and soil moisture and an intimate knowledge of all the species of trees, shrubs and herbs that make up the vegetation, and of the value of each as an element of landscape.

All living vegetation found on the ground, which is to be turned into a park, including thickets of shrubs and the undergrowth in woods, should be wholly undisturbed until a plan of the grounds and planting is completed.

So much of the existing vegetation as the plan retains should be developed to meet the requirements of the different parts of the plan by the removal of objectionable species and individuals, by the encouragement of desirable species, and by judicious thinning, trimming and by fertilizing the existing soil.

Where particularly vigorous and long-lived individual trees and a good and enduring green turf are required, the soil must be thoroughly enriched, prepared and drained.

As a park is to last for all time, it is essential that when it is to present real forest growth, this be made up of sufficient varieties to repair and disguise injury done to any one or more species by insect enemies or disease. The existing undergrowth should be developed or one should be made of shade-enduring plants to protect the roots of trees and furnish a liberal supply of leaf mold, nature's fertilizer, and add to the interest of the woods.

Permanent individual trees should be selected of such varieties as are known to be long lived and healthy. Short-lived trees, if used, should be placed in the least important positions.

Native, not exotic plants, should be depended upon to secure permanent landscape effects.

Only young, healthy, vigorous plants should be planted. Only exceptional circumstances would justify the use of very large plants in park planting, and if used they must be handled with very much greater care than is usually given them. Every park or park system should at an early stage establish propagating facilities and a nursery in which to propagate or grow on from small plants the nursery stock that will be required in all planting operations.

When a park has been fully planted in accordance with the original design, only such new plantations as are required to repair losses should be added.

A thoroughly trained park designer of artistic instincts has clearly defined in his mind or fixed by his detailed plans a composition which will be a complete picture, harmonious in all its details.

Such a design may be as completely ruined by new plantations not contemplated in the original design as would

be additions to the painted landscape of an artist made by other hands than his own.

WARREN H. MANNING,
Sec'y Park and Outdoor Art Ass'n.
BOSTON, MASS.

Street Trees.

This is the season of tree-planting, and all over the Northern States the progressive citizen is endeavoring to settle the vexed question of what to plant. If the tree men would only develop a "general-purpose" tree as the stockmen have developed a general-purpose horse, it would simplify matters very much. But perish the thought! There are towns where the general-purpose tree has been discovered and used in every street with results so monotonous as to prejudice the mind of the artistic beholder against the unoffending species forever.

No, there is no one species that represents the *summum bonum* for street planting, for one of the first requisites is variety, and no one species is so many-formed as to fill the bill. It would be a happy thing for every town, however, if the residents of a street could agree to plant their entire street with one kind of tree, and if this be too much to hope for, at least let all the residents of a single block agree upon one species, so that there shall be uniformity in the planting—the desirable variety will be secured if the people on the cross-streets select different trees. Nothing can be finer than avenues formed by well-grown trees of one species, equally spaced, and with each year extending their protecting branches over the sidewalks and roadway. And by contrast an otherwise beautiful thoroughfare is often ruined by an unfortunate lack of harmony in planting, each resident using the tree of his choice, and the result being two straggling lines whose individuals are of all shapes, sizes and conditions.

But in the planting two varieties should always be set—a rapid-growing, early-maturing form, with one of slower development, of more permanent character. These should alternate with one another on both sides of the street, or if four rows of trees are used, the alternation should extend to each row.

In this way the desired shade can be secured at the earliest possible date, while at the same time a superior form (the rapid growers are never the best, and are seldom durable) will be coming on, to be given full room when they begin to be crowded by the removal of the quick growers.

As to the particular species to be chosen there should only be for us the difficulty that comes of embarrassment of riches; in a land where hard and Norway Maples, Red and Black Oaks, White Elm, Sycamore, Basswood, Hackberry, Tulip, Red Maple, Willow Oak, Box Elder, Locust, Catalpa, Ginkgo, White Ash and a host of other tree forms thrive, surely there is no lack of choice.

In choosing street trees one would do well to consider carefully those qualities which will insure long life and usefulness, and hence such attributes as endurance, recuperative power, cleanliness, shade, beauty, rapidity of growth, duration of foliage, persistence and size should be carefully looked into and their relative importance determined as expressed in the species desired.

The Tree-Planting and Fountain Society of Brooklyn printed a table in 1893, in which the several species named were rated on these points, the result being the following list, the first named group scoring highest: large trees—Red Oak, Scarlet Oak, Yellow Oak and White Elm; Sugar Maple, Black Maple, Tulip Tree, European Linden, Small-leaved Linden, Sweet Gum, White Oak, Bur Oak, Oriental Plane, Kentucky Coffee Tree; Sycamore; Sycamore Maple, Basswood. Medium sized trees—Red Maple; Shingle Oak, Willow Oak, Slippery Elm; Norway Maple, Box Elder; European Elm, Scotch Elm, Hackberry; Silver Maple; Ailanthus, Horse Chestnut, Japanese Sophora, Catalpa, Ginkgo, Honey Locust, Cottonwood, Balm of Gilead; Black Locust.

Of course it will seldom happen that one can find all, or even a fourth of these species in sizes suitable for street planting, in the nurseries, in which case the difficulty of selection is greatly simplified. For myself, my first choice for a street tree would be Red Oak—A species that never occurred to me would be useful for the purpose until I saw the thrifty specimens in the streets adjoining the Agricultural Department in Washington. They are clean, uniform and vigorous. Sugar Maple, White Elm and Basswood are three other natives that succeed well in the North, though we are yet to find a practical way of destroying the Elm-leaf beetle and we must be patient with the slow growth of the Sugar Maple when young.

In choosing street trees it is well to select such as have a continuous stem from the collar to the topmost branch. Avoid forked trees, even when the fork is well up in the crown, for it will often happen that the crowns have been formed too low, in which case a straight stem will admit of raising the crown by gradually removing the lower branches.

Moreover, as the tree will require more or less heading-in when transplanted, a much more symmetrical crown can be secured if there be a continuous stem from base to top. ——R.

Trees from South Asia Acclimated in Southern California.—I.

Visitors to California are surprised to see how trees from Australia have found a second home here, and the various species of *Eucalyptus*, *Acacia*, *Grevillea*, *Casuarina*, *Araucaria*, etc., are imparting already peculiar features to the landscape, the *Eucalyptus* furnishing our chief supply of fuel. Not so generally known, because more recent, is the fact that in southern California there are trees from almost every quarter of the globe growing vigorously and thriftily, their number being large already and constantly increasing. One needs not to be farsighted to anticipate the influence this will exercise in widening the resources of landscape-gardeners and foresters. To be sure it will take several years before a manual of trees can be published for this region, with full details of the adaptability of each to different locations; but it can be safely stated now that southern California is able to nurture plants which have originated in widely different climates, and is eminently fitted to become the trial-ground also for other parts of our broad land. Whatever facts can be registered by actual experience here possess, undoubtedly, a far-reaching importance, in some cases even beyond the limits of the United States. A very remarkable circumstance, to which I would like to attract attention, is the number of trees from India and other parts of southern Asia that have already shown their ability to flourish here. Some of them come from the high regions of the Himalaya, but not a few from the lower tropical plains, and even from the jungles of the Malayan peninsula and of Cochin China, where the annual rainfall is at least ten times larger than ours, while during the dry season plants are exposed there to more intense heat and drought than we ever have here. How it does happen that such trees so easily adapt themselves to our soil and climate I will not venture to explain; the facts, nevertheless, exist. Some of the trees I am going to mention have been growing here several years, blooming and bearing fruit; others are only of recent introduction; but experience teaches that with us the critical period for most exotic plants is just within the first months from their birth, and it can be positively stated that after a plant has gone through safely for a whole year it can be considered as acquired to us forever. In the enumeration that follows I will confine myself to mention only trees, or tall-growing shrubs.

Magnoliaceæ come first, with the stately *Michelia champaca*, so much planted near pagodas in India, and admirable for its broad light green foliage and strongly scented yellow flowers, together with the smaller-growing and smaller-

flowering, but not less perfumed, *Magnolia fuscata*, from China.

Bixineæ are represented by *Flacourtia ramontchi*, a small spiny, thick-growing tree, bearing fruits known as "rambustans" and Governor's plums in the West Indies, to which it was introduced long ago.

Pittosporeæ, of which we had already several species from Australia, New Zealand and the Cape, now have an Indian representative in *P. nilghirense*, possessing large rich foliage, not unlike that of the more familiar "Loquat," *Eriobotrya japonica*.

The extremely tropical order of *Guttiferæ* is represented by *Kayea eugeniæfolia*, a native of Cochin China, from where seeds were received. The coriaceous oval-shaped leaves are beautifully tinged with red when young.

Besides Camellias and Tea belonging to a more northern region, *Ternstræmiaceæ* are represented by the choice and handsome *Gordonia anomala*, from Hong Kong.

Malvaceæ have contributed different sorts of *Hibiscus rosa sinensis*, among the most gorgeous ornaments of our gardens; also the curious *H. mutabilis*, and *Kydia calycina*, from India, this last having large pink and white flowers.

Reevesia thyrsoidea, from Hong Kong, represents *Sterculiaceæ*, of which we had already one representative from temperate China, and two or three from Australia.

Indian *Tiliaceæ* have furnished the monotypic genus, *Berrya ammonilla*, a large tree, yielding the much-prized Trinchomalee-wood.

Rutaceæ, in addition to the various Citrus fruits, most of which have had their origin traced to India or southern China, are represented also by *Murraya exotica*, so deliciously scented; by *Glycosmis pentaphylla* and *Clausenia Wampi*, both bearing much-prized fruits.

Burseraceæ, all of them more or less yielding balsam, are represented by *Garuga pinnata* and *Bursera serrata*, both from India.

Melia azedarach, originally from Persia and India, typifies the *Meliaceæ*, having been grown many years in this country, under the popular name of Pride of India and Pride of China. The parasol form of this tree, commonly known as Texan Umbrella, originated in Texas several years ago, and is not much known out of this country. Other *Meliaceæ* recently added to our exotic flora are *Aglaia odorata*, from the eastern Indian peninsula, bearing exquisitely-scented yellow flowers, used in China to perfume some brands of tea, and *Cedrela toona*, from the tropical Himalaya, one of the best Indian timber-trees. *C. serrata* we have also, which has been referred as a mere form to the preceding; this is common throughout the Himalaya at an elevation of 8,000 feet.

Celastrineæ have given us *Evonymus tingens*, from the western temperate Himalaya, yielding a red dye, and *E. glaber*, from eastern Bengal.

To *Rhamnaceæ* we are indebted for *Hovenia dulcis*, bearing sweet fleshy peduncles to its fruits; a native of Japan also, from where it was introduced to this country.

Sapindus utilis, believed to be a form of *S. Mukorossi*, is typical of *Sapindaceæ*, and likely to become a most valuable introduction on account of the large percentage of saponine yielded by its fruits. *Nephelium Lit-Chi*, known as *Lee-chee* and Chinese Cherry, has been introduced also, although the fruit has not been produced up to the present time.

F. FRANCESCHI.

SANTA BARBARA, CAL.

Seed Selection.

The question of how far the locality of the parent tree influences the hardiness of its seedlings is one on which much speculation has been indulged in and concerning which but few systematic observations have been made. It is of especial interest as connected with our forest species, because of their wide distribution and the greater ease or cheapness with which seeds can be secured in one locality than in another. Sev-

eral instances of note come to mind. The Douglas Spruce (*Pseudotsuga taxifolia*) is a native of the Western mountain region. On the western slopes in the moist, temperare climate of the Cascades and the valleys beyond it reaches its greatest development, the trees sometimes attaining a height of over 300 feet and commensurate diameter. On the eastern slopes of the Rockies with a dry, vigorous climate it is comparatively a small tree, in some localities seldom over one hundred feet in height. But the seedlings of the Pacific slope trees are tender in the Mississippi Valley, while those of the drier Rocky Mountain region are hardy.

Mr. Robert Douglas, the veteran forest-tree nurseryman of Waukegan, Ill., found by experiment that even within the small limits of his prairie State the Black Walnut grown from trees native in the Waukegan woods is much more hardy than from trees the seed of which was secured in the southern part of the State: the latter winter-killed badly.

Many a failure undoubtedly occurs by neglect of observing this influence of locality on the hardiness of the tree.

Plantings of Elm, native and from Nebraska, side by side at the agricultural stations of the Canadian Government, exhibit most strikingly such an influence.

Many of our species, like the Oaks, Elms, Maples and others, have such a wide range of distribution over territories very varying in temperature and moisture conditions, that it would be very natural to find the same species as exhibiting a wide range of hardiness with regard to moisture as well as temperature. Proper selection of plant material from this point of view therefore is the first requisite.

The extent of this variation is a practical problem that can only be determined by experiment, in which the U. S. Division of Forestry, in co-operation with the Agricultural Experiment Stations, has lately engaged. Meanwhile, the safest plan for intending planters is to secure their seed as near home as possible and their seedlings from nurserymen who use care in obtaining their stock from localities that insure its hardiness.

C. A. KEFFER.

Afforestation of Abandoned Fields on the Biltmore Estate.

During the past year I have received scores of letters asking for advice to be followed in planting abandoned fields.

It is absolutely impossible to give any definite information without a thorough knowledge of the purpose of the planting (money making, landscape, shelter for game), and a fair idea of the conditions of soil, climate, railroad facilities, wages, etc.

The abandoned fields on the Biltmore estate are those not claimed by the farm department, the soil being so exhausted or the slope of the ground being so steep as not to permit of profitable use for field crops or pasture.

The table following below is computed from data furnished by actual experience last fall. Under expenses there is not included the salary of the ranger superintending the field work, nor is allowance made for wear and tear of tools.

The wages of ordinary labor at Biltmore are $1 per day for "hands" and $2.30 per day for teams.

The prices of seeds delivered to the areas to be planted, purchased from farmers in the neighborhood, varied according to the number of good seeds found in 100 seeds. For instance, if there were 75 sound seeds in 100 seeds, I paid 75 per cent of the "list price" per bushel.

All seeds were put in furrows 3 feet to 4 feet apart, according to the slope of the ground—the steeper the slope the wider the distance apart, so as to allow of cultivating without injury to the tender seedlings.

The distance of seeds within the rows was about 4 inches in the case of White Oak and Chestnut Oak, 8 inches in the case of Red Oak and Buckeye, and 12 inches in the case of Walnut and Hickory.

The distance depends on the quality

of seeds actually used and on the percentage of seedlings expected to develop from each 100 sound seeds.

All plantations are made for forestry and landscape purposes combined.

The aggregate expenses are higher than necessary under ordinary conditions, the desire for quick results being prevalent at Biltmore.

In order to check the ravages of field mice making havoc in the plantations, it is necessary to cultivate the plantations about four times during a year or two at an expense of about 40 cents per acre each time. The roots of a seedling in its third growing season are strong enough to offer sufficient resistance.

The aggregate cost of planting heavy seeds on an extensive scale ought not to exceed $12 per acre.

FALL, 1897.

Plantations of Seeds on Abandoned Fields.

MIDDLE RANGE.

Locality compartment.	Area Planted. Acres.	Aspect and Soil.	Species.	Quantity Sown. Bushels.	Per Cent Sound Seeds.	EXPENSES. For Seeds.	For Plowing.	For Clearing.	For Planting.	Total.	Average Expense per Acre.
34	2.00	Western, stony....	Walnut.....	25.0	100	$15.00	$ 5.60	$ .65	$ 8.35	$29.60	$14.80

Only part of the area ploughed was planted.

RIVERBEND RANGE.

18 A	2.70	Northern, gentle, good.....	Buckeye.....	6.0	100	4.20	4.40	.....	2.00	37.53	13.90
			Walnut.....	24.0	100	14.40			9.25		
			White Oak.....	4.0	82	3.28					
Coxehill.....	14.00	South, east, steep, dry.....	White Oak.....	48.0	82	39.36	8.82	.....	39.60	120.30	8.59
			Chestnut Oak..	34.0	78	26.52					
			Walnut.....	8.0	100	4.80					
			Hickory.....	1.0	100	1.00					
			Buckeye.....	0.2	100	0.20					

ARROWHEAD RANGE.

68	.25	S. W., dry.....	Chestnut Oak....	2.0	78	1.60	.30	.50	1.00	3.40	13.60
46	.30	Old garden spot....	Red Oak.....	2.0	90	1.80	.60	.50	1.00	3.40	11.33
46	1.00	W. slope, steep.....	White Oak.....	8.0	82	6.56	.90	1.00	3.50	11.96	11.96
46	.80	N. slope, gentle....	Red Oak.....	4.0	90	2.60	.60	1.50	2.50	7.20	9.00
47	1.90	N. slope, good.....	Red Oak and Walnut.....	10.0 6.0	100 90	6.00 3.90	2.30	1.50	6.00	19.70	10.37
61 B	.30	Level, good.....	White Oak.....	3.0	82	2.46	.90	.....	1.50	4.86	16.20

WEST RANGE.

76 H, 77	*1.00	Slope and ridge...	Walnut.....	12.0	100	7.20	.....	.....	4.00	11.20	11.20
78	4.00	East, good.....	Walnut.....	62.0	100	33.00	4.00	3.00	15.85	57.49	14.37
			White Oak.....	2.0	82	1.64					
79-81 and 80 82	†12.25	Plateau, variable..	White Oak.....	43.0	82	35.26	17.05	.....	20.05	.....	.....
			Chestnut Oak...	9.5	78	7.41			4.70		
			Hickory.....	16.0	100	16.00			4.80		
			Buckeye.....	4.0	100	2.80			2.00		
79-81 and 80-82	‡7.25	Plateau, variable..	Chestnut.....	0.5	80	.50	.....	.....	.50	111.07	5.70

*Seeds were put in holes made with a spade.
†Planting in furrows between rows of trees put in previously, such rows 6 feet apart.
‡Planting in furrows 3½ feet apart, on sections of the same field where there were no trees planted previously.

Assuming that the plantation will be ready for the axe after another 100 years, that the value of the land is $5 per acre, and that the annual expense for taxes, administration, etc., is 15 cents an acre, the final yield must be $265.57 per acre, in order to make the original investment pay 2½ per cent of compound interest. A money yield of $265.57 per acre corresponds with a stumpage of about 40,000 feet B. M. (equal to, say, 160 cubic meters) lumber per acre, worth $6.65 per 1,000 feet B. M.

Of course, apart from the final yield there will be a number of intermediate returns yielding firewood, tan bark (Chestnut Oak), seeds (Walnut), fence posts (White Oak), etc., which will render the interest on capital invested considerably higher than 2½ per cent.

The output expected is a figure actually ascertained for similar conditions and similar species in Germany. As to the value of the expected output I believe that increased population, exhausted virgin supplies, rising demand and improved means of communication will make good timber as valuable in the United States after some scores of years as it is in Germany and France now, and under such auspices the price of $6.65 per 1,000 feet B. M. adopted above must be considered rather low.

In Germany and France the present price of sound oak logs measuring about 15 inches at the small end, is, say, 40 marks per cubic meter, equal to about $40 per 1,000 feet B. M. and runs up to about $80 for first-class oak logs of about 30 inches diameter at the small end.

I can only reiterate, what has been mentioned in these pages lately, that the Saxon forests in Germany, for which official data are available since 1816, have paid annually a net revenue of 3 per cent apart from the fact that their value increased at the rate of 2½ per cent (compound) per year.

C. A. SCHENCK.

Biltmore, N. C.

[The cost of planting varies, naturally, very greatly under varying conditions. In comparison with the above it is of interest to note how cheaply planting may be done in the prairies, by referring to the Report for 1897 of the Canadian Experimental Farms, in which Mr. Angus MacKay, superintendent of the farm at Indian Head, reports the cost for five half-acre plots of box-elder and green ash, plants set about 2½ to 4 feet apart and cultivated two years, in which the cost varies between $4.80 and $6.00, while taking up the plants for the five plots required an additional $3.38. Two half-acre plots, sowed in rows 2½ feet apart and two years cultivated, had cost $4.79 and $5.02 respectively.

EDITOR.]

Forestry in Virginia.

Being especially interested in the treatment of sandy lands and the protection and culture of forests of the smooth-bark or Shortleaf Pine, I was led to visit the two counties of Virginia, Northampton and Accomac, the southernmost portion of the peninsula formed by the confluence of the Chesapeake Bay and the Ocean. According to Dr. Mohr, the smooth-bark or Shortleaf Pine (*Pinus echinata*) is for many reasons the forest tree of the future for a large portion of the Southern Atlantic States.

The large Coastal Plain beginning with Southern New Jersey would soon be capable of producing almost limitless quantities of this valuable timber were it properly protected from reckless devastation. With Cypress and White Cedar in the swamps (the latter equaling, if not excelling the White Pine in quality of its wood) and Shortleaf Pine on the uplands this region is capable of yielding a perpetual supply of timber suited to almost all kinds of construction. The Shortleaf Pine is well fitted for coarse stuff—for houses and ships, and boards for floors and ceilings, and is excellent for pilings and timbers for wharves and poles for telegraph and telephone lines,

while the Cypress and Cedar serve for shingles and finishing boards and other purposes for which the Pine is not suitable.

I was told that in the two counties mentioned above the forests were being properly cared for and even propagated without the aid of foresters or forest laws. My surprise was of course great when I found the region even more than was anticipated and that at least in one part of the Eastern States the forests are free from fire and the sentiment of its people wholesome in reference to their natural resources. This little spot in Virginia demonstrates that if the people are of the right mind the protection of Pine forests is not only possible, but simple, easy and inexpensive.

The region reminded me of the Medoc and the fields of young Pines resemble the blocks of the Maritime Pine along the shores of Gascony. Almost every farm has its Pine forest. These, of course, are of all sizes and ages, varying from fields as thick and dense as wheat to forests fit for large size timber. There were few signs of forest fires, which the natives say are always promptly extinguished.

The truth is, in fact, the inhabitants have a forestry system of their own, which Americans can study to great advantage.

The soil of this region is light and sandy, being dunelike in nature along the shore. The Pines grow close to the shore, although a few have been killed by the shifting sand. The natives recognize the value of the forest in holding the soil in place and in protecting their truck patches from the force of wind, which would naturally at times sweep furiously over this narrow peninsula.

On entering one of these forests one observes at once that although there are small trees of Sweet Gum and Holly, the ground is free from litter and brush. If one happens to visit the region at the proper season he will see men and women raking up the forest litter. The Pine "chats," "needles" or "browse" are valuable for a fertilizer and are spread on the neighboring fields. These are used for bedding their stock—Accomac being famous for its blooded horses. In fact, it is a land of plenty, with all the bay and sea afford, besides wild game in abundance. The pine chats produce a fine grade of sweet potatoes. The writer is unable to say whether there is a peculiar manurial value in the pine leaves or whether they merely add to the porosity, acting no doubt at the same time as a mulch, although they disintegrate and disappear in the course of a single season * About this season of the year one can see field after field covered with pine chats to be ploughed under just as soon as the weather permits. In fact, the fields are laid out in squares by means of the plough in order that the pine chats can be easily measured and thus evenly distributed. Just as soon as a field becomes fallow the farmer leaves it to nature. The neighboring seed pines furnish the most, the winds sow it and soon a fresh young green growth appears as dense and level as a field of grain. Here and there throughout the forest there are avenues which, although constructed to facilitate the collection of pine chats, serve at the same time the purpose of fire lanes.

Now the great question is: Why don't they have fires? Stranger still their jails are often empty. A concurrence of circumstances no doubt accounts for this immunity. Because of the value of the pine chats the forest floor is free from inflammable materials just at the time when fires are most likely to occur, namely, in the spring. The removal of this débris may be contrary to the principles of German forest management, because it naturally impoverishes the forest soil, but on the other hand Pines that grow slowly produce the best wood,† and besides, a part of the forest incre-

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*The German literature on this subject is quite exhaustive. The manurial value of pine straw lies mainly in its nitrogen contents. From one acre there may be had annually about 2,500 pounds of straw furnishing about 20 pounds of nitrogen, 12 pounds lime, 3½ pounds potash, 3½ pounds magnesia and less than 3 pounds phosphoric acid.—EDITOR.

†This statement is hardly borne out by the facts. See also p. 83 of this issue regarding effect of the removal of litter.—EDITOR.

ment, to the ultimate good of everything concerned, is converted into as fine a grade of sweet potatoes as ever grew. In the course of time, however, these potato fields are allowed to come up in Pines and fresh fields are cleared when the Pines have been cut. This, fortunately, is easy, because the sand is soft, the stumps do not sprout but are quickly honey-combed by wood-eating insects and finally decay.

Another point of great advantage is that the forest is not continuous, but cut up into parcels with farm lands intervening. The land is also in the form of so-called "necks," that is, small peninsulas jutting out into bays, or strips of land between small bays or streams. There is only one railroad which runs straight down the peninsula. This road is ballasted with oyster shells and ditched on both sides. What, however, is most important in reference to the fire question is the fact that the people are an honest and law-abiding set. The truth is, the shameful condition of our forests is, as Dr. Fernow says, a question of morality. In regions inhabited by a wild, heterogeneous set of half-starved rogues you will find forest fires and full jails. The great question in connection with American forest fires is not how to extinguish them, but how to prevent them. The employment of wardens to extinguish fires is like caring for the sick in a typhoid epidemic without purifying a contaminated water supply. Time spent in extinguishing forest fires is to a certain extent time lost, because there ought be no fires to extinguish. The real work of the forester does not begin until fires are stopped. The prevention of fires, or at least all fires except those accidentally, unavoidably set, belongs to detectives, sheriffs and the courts. The first step in the prevention of fires is the conviction and punishment of all persons or corporations guilty of causing them. Well-enforced laws of this kind will reduce the record seventy-five per cent. The forest owners, being encouraged by the prospect, will take care of he rest. After fires are stopped Nature, with a little help, will do the rest, as she does on the peninsula of Virginia. It is not so much a question of forestry as it is of justice. The same applies to other industries as well. JOHN GIFFORD.

Forest Destruction and Waterflow.

[All readers of THE FORESTER are urged to contribute definite and authenticated observations as to forest conditions and forest influences.]

SOUTHERN CALIFORNIA. II.

The bee men of Los Angeles County, whose apiaries have for the most part been in the same situations for many years without damage from floods, were washed away almost everywhere whenever the watersheds behind them were denuded. Here is an extract from a newspaper giving an account of the bee men's misfortunes in a year of only average rainfall:

"Great damage has been done to many apiaries in Southern California by the January floods. Much damage was done in the Santa Monica Mountains, and the overflow of the Los Angeles and San Gabriel Rivers destroyed hundreds of hives in the lowlands. Nor could any foresight prevent the destruction of bees in these lowlands. for no one could possibly foretell that the water would have reached the points it did. As the valleys and mountain sides are cleared of the natural growth of timber and shrubs the impediments to the rapid flow of water over the land surface are removed, and we may look for greater floods than have heretofore been known, unless this rapid flow of water is checked by growing either timber or grapes on the mountain sides. Where it can be done the bee master should plant trees."

Mr. James Craig, of the Hermitage Ranch, informs me that for some years after the great Edwards fire on the watershed of the Precipice Canon the stream diminished in its summer flow without regard to the rainfall, and is only now becoming itself again. This fact forced itself on Mr. Craig, as his entire water supply came from this stream. In one place this water-course was filled up sixteen and a half feet, by actual measurement, with sand and bowlders.

I am informed that the watershed of my canon was burned over before my arrival

—the traces are still plain in burnt trunks of trees—and that the summer flow of the spring on which I depend was thereby materially diminished, while during the rains great quantities of sand and bowlders were washed from the mountain, altering the appearance of the canon. After my purchase of the property from Mr. Robert Bayley, I ordered a sycamore to be cut down and the stump taken out. On going to see how the work progressed, I found the men digging out a chicken coop frame ten feet below the surface, which must have been buried by the torrent. About six years ago I settled in the San Gabriel Valley. The road to my ranch from Los Angeles passed through what is now the town of Pasadena, then consisting of one store, a schoolhouse, and a number of orchards. At that time, between the Arroyo Seco and Precipica Canon, there was not a single watercourse. While these lands enjoyed an immunity from torrents, the foothills and mesas were covered with native growths of brush and chaparral, scrub oak, greasewood, sagebrush, etc. Every succeeding year has seen more of this covering removed from the land by clearing or fire, until now nearly all the mesas are bare of verdure.

Two years ago a torrent, now very plain, crossed, for the first time, the Mutual orange orchard, Mr. McCullum's orchard and many other places, going down as far as Mr. Foord's. Last year, though the rains were so light, this torrent ran several times. This year, however, the rains have already been heavy, causing much injury along the line named.

ABBOT KINNEY.

Echoes from European Forestry Journals.

As the result of practical tests made in Rhenish Prussia, Prof. E. Ramann announces that the increment of trees standing on areas frequently denuded of litter is decidedly and considerably reduced, the trees (Beech) are getting stagheaded and the soil is getting hardened. The chemical constituents of the soil are not affected by the removal of litter (brush, leaves, etc.), but the physical condition is much harmed, the porosity being lessened and the soil rendered more compact. [In our forests the vegetable mold or litter is almost everywhere removed as closely as possible by forest fires!—EDITOR.]

Pinus rigida, Pitch Pine is strongly recommended for planting the poorest class of lands, as sand dunes and shifting sands. *Pinus divaricata*, the Jack Pine, has given the greatest satisfaction, being even less exacting than Pitch Pine, and growing almost twice as fast in early growth as Scotch Pine.—*Zeitschrift für Forst und Jagdwesen.*

Prof. Adam Schwappach has just published the result of official investigations into specific gravity and compression strength shown by the timber of Scotch Pine. He finds that the relation existing between specific gravity and compression strength is influenced by age of tree, soil, and general conditions of growth. He adopts the important discovery made by the U. S. Division of Forestry, that the compression strength stands in direct relation to the bending strength.—*Oesterreich. Centralblatt f. d. g. F.*

Scotch Pine, in a large majority of cases, has been regenerated in Germany by planting seedlings one or two years old after a clear cutting of the mature crops for the last 50 years. Recently, however, the natural regeneration of Scotch Pine from self-sown seeds has been assiduously advocated by Dr. Borggreve, not only for shifting sand or for the plains, where fungi and insects threaten death to seedling plants when lacking the shelter of mother trees, but for any and all cases, where Pine is to be propagated.—*Forstwissenschaftliches Centralblatt.*

[While at Biltmore, and probably anywhere else in the sunny South, natural regeneration of *Pinus mitis, rigida, tæda* and *strobus* seems to be an easy matter it would appear to be rather difficult in

Germany to raise a light-demanding species (which the Scotch Pine certainly is), overshadowed by mother trees. However, under favorable conditions and through good management, the experiment of producing dense thickets of Pine from self-sown seed was found successful near Frankfort-on-the-Main, Germany.

An American lumberman will scarcely believe that the German forester succeeds in removing from each acre of ground about 200 full-grown Pine trees, scaling on an average sixteen inches at four feet from ground, without damaging the dense growth of seedlings started underneath them, and without affecting the financial outcome of the whole undertaking. The secret of good work lies in the words: supervision, discipline and proper contracts.—C. A. S.]

Prof. R. Hartig arrives at the following conclusions concerning the formation of wood in Spruce trees:

1. The better the quality of the soil, the heavier is the specific gravity of the wood formed.

2. The wood formed by tall trees is lighter than that formed by small trees standing in the same locality, owing to a difference of leaf evaporation.

3. The weight of the wood formed at the base of a tree is comparatively light. At about fifteen feet above ground it reaches its maximum. From that point on the specific gravity of wood taken from different sections of the stem gets gradually less, reaching a minimum just below the crown, at about 60 feet above ground. Within the crown of the tree the specific gravity of the wood rises again.

4. The influence of dry weather during early summer upon tree growth is very marked.

Few botanists realize that the annual growth of the body of a tree is confined, at least in the temperate zone of middle Europe, to a period of less than three months. For Beech, in a case closely investigated by R. Weber, it was found that the growth of the annual layer (yearly ring) began 30 days after the first opening of the leaf buds. Of course, the length of such periods depends entirely upon temperature (especially maxima and minima of temperature) and precipitation.—*Forstlich-Naturwissenschaftliche Zeitschrift.*

Prof. Rudolph Weber, of Munich, has advanced the knowledge of the mathematical laws of tree growth further than any other scientist. His newest investigations reveal the fact that from about the fortieth year on, the annual increment in the cross-section of a healthy and dominant tree in regular high forests remains practically unchanged. This natural law holds good for any cross sections made between crown and base of tree. Consequently, the volume increment of a tree must be steady and even from about the time at which the principal height growth is completed.—*Allgemeine Forst und Jagd Zeitung.* C. A. S.

Book Notices.

The Harbor and Land Commissioners of Massachusetts have recently issued their report for 1897, which contains an account of the dune planting in the Province Lands. It is the intention of THE FORESTER in a future number to review this planting, which gives promise of complete success.

The Annual Report of the Tree Planting and Fountain Society of Brooklyn, N. Y., for 1897, has been published, and shows this excellent organization to be in a flourishing condition. Much space is devoted to letters of correspondents, which, while they indicate widespread interest in the work of the Society, certainly add but little to the reader's store of knowledge. The book would be more useful were the many articles on different phases of the same topic brought together. As it is, one finds the same general topic in widely separated places, making it easy for important articles to be overlooked. This fault is largely corrected, however, by an unusually full index. And, after all, these are minor faults, and may well be excused when

one notes the general excellence of the report in its entirety, and sees how full and explicit are the answers to such questions as present themselves to the tree-planter whose efforts are confined to streets and small lawns. [The Tree-planting and Fountain Society, 177 Remsen St., Brooklyn, N. Y.]

The Twenty-sixth Annual Report of the Board of Park Commissioners of San Francisco contains a sketch map in colors of Golden Gate Park, the far-famed pleasure-ground, which is the pride of the Western Metropolis. The report is embellished with lithographic views of salient features within the great park, and the text is devoted largely to a narrative of the work of the year and the present condition of their charge, which does credit to the Commissioners, and is rich in suggestions to park managers elsewhere.

In the recently issued Annual Report of the Pennsylvania State College and Experiment Station, Professor Wm. A. Buckhout describes a Chestnut orchard of twenty-five acres on the Engle Farm near Marietta. The orchard has been made by clearing a mountain side, much too rough for tillage, leaving Chestnut sprouts at about the intervals allowed for fruit trees, and grafting the sprouts with scions of the Paragon Chestnut. Professor Buckhout gives details of grafting method and after-treatment, and persons interested in nut culture will find his essay both practical and readable. The army worm and its enemies are discussed and illustrated very fully in this report, and there are other subjects of great interest to farmers and fruit-growers. [Pennsylvania. Report of the State College, 1896.]

Ornamental Planting for Parks and Public Grounds, by Wm. S. Egerton. This is a brief paper by the Superintendent of Parks in Albany, N. Y., outlining the scheme of work for such grounds, which will, perhaps, be more useful to the layman and citizen in getting a better conception of what park work means, than to the landscape architect, since the public through the press and otherwise asserts knowledge and tries to influence park management. It is good policy to place such brief discussions from professional pens into the hands of the public, whereby the criticism is directed in proper lines and the interest in the parks increased by an increase in the knowledge of the technicalities involved.

Country Parks, by Prof. T. H. Macbride of the State University of Iowa, is a suggestive paper extracted from Volume III of the Bulletin Lab. Nat. Sci. of that institution, advocating in an able manner the establishment of such parks "for country and city folk alike—1. as directly affecting public health and happiness; 2. for proper education; 3. to preserve to other times and men something of primeval nature." The most serious difficulty, namely, that of the means "of securing, owning and caring for several hundred, or for that several thousand, acres of land to be used by all the people," he meets by appealing to the generosity of private citizens.

In Germany the forests, which the cities, villages, counties or the state governments possess, serve the purposes of such parks, and in addition furnish a neat revenue. We do not see any reason why this may not come eventually in our country when the people live not on charity but possess their own pleasure grounds as well as forests.

Forest Growth and Sheep Grazing in the Cascade Mountains of Oregon, by Frederick V. Coville, has just been published as Bulletin 15 of the Division of Forestry, U. S. Department of Agriculture. It discusses in great detail observations on the sheep industry in that State, with a view of ascertaining how far the same may be objectionable to the purposes of the Cascade Forest Reservation, and suggests regulations under which it is believed the industry can be carried on without detriment to forest growth and to its own continued advantage.

Answers to Correspondents.

Is the wood of young Catalpa trees durable when used as fence posts?

The heart wood of mature Catalpa (*C. speciosa*) is very durable in contact with the soil, rivaling Cedars in this respect. The species is of the most rapid growth during youth, and the wood formed during this period is, as in all trees less valuable, in every way, than that which is formed later. Although we have no experiments or even reliable trials and observations at command, we are inclined to think that the wood of young Catalpa is little, if any, more durable than Red Oak, and does not compare with the wood of the same species from mature trees. Questions of relative durability are difficult to settle, because, not only the inherent capacity of the species to withstand rot, but also all the surrounding conditions favoring rot, and the treatment of the wood must be taken into consideration and be identical to permit comparison and generalizations.

Are the repeated frosts occurring in Florida due to the extensive cutting of the forests of this State and of Georgia and Alabama?

This question our "Arbor Day" friends are apt to answer straightway in the positive, while our "knowing meteorologists" would probably pooh-pooh the very idea of any connection between the two phenomena. The "wise man" will "suspend judgment" for the reason that there are no tangible data by which to answer.

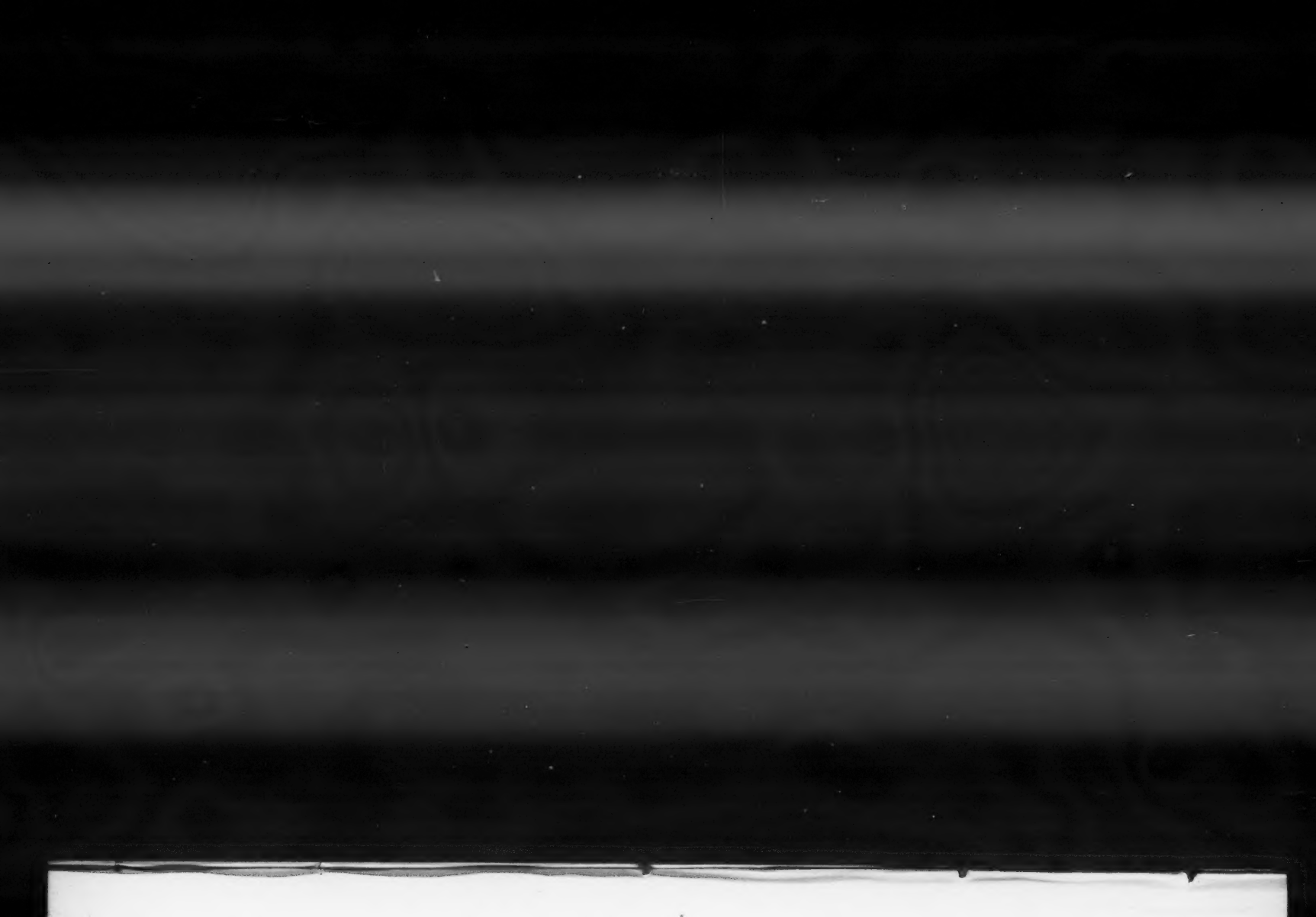
That frost phenomena locally are frequently influenced by local conditions of forest cover, windbreaks, and so on, is a matter of such well-established practical experience that we need not ask any meteorologist. "Frost holes," so called, where young plants fail from an accumulation of cold air without the chance of circulation are remedied by cutting away trees, in order to establish a draft, which permits the cold air to draw off. On the other hand the wind-breaking power of a forest belt, which reduces the evaporative power and mitigates (probably only to a small extent) the temperature of the winds protects an orchard under its shelter from frost dangers. Whether these local influences can be supposed *in toto* to apply to large geographical sections is another matter. There is in reality not as much actual denudation over the area in question as to much reduce the wind-breaking power of the forest areas, we believe, and while their thinning out may allow a freer sweep and entrance of cold currents to orchards, we are inclined to believe that the "freezes" were probably due to a more general cosmic cause. Nevertheless we have been informed that some well-sheltered orchards within the frost region escaped damage, so that general conditions were counteracted by local conditions, which is finally the practical point of the question.

Are there any graphic charts to illustrate our forest trees for school use?

There is, as far as we know, nothing in existence to fully illustrate our trees as a whole.

An excellent means of bringing children not only but grown folks to a better knowledge of our forest trees is furnished by Miss Graceanna Lewis' Leaf Charts, of which we have seen four devoted to an elucidation of different species of Hickories, Walnuts and Oaks. The drawings being of natural size and very well executed furnish a better means of identification than anything we have seen. We hope that Miss Lewis, who, as a member of the Academy of Natural Sciences of Philadelphia, and a teacher of long experience may be trusted to do reliable work, will continue this work until our whole forest flora is so illustrated. See advertisement in this issue.

Correspondence, Advice and Contributions to THE FORESTER are cordially invited!



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